EXCISION OF THE EXTERNAL TWO-THIRDS OF A GASSERIAN GANGLION, BY THE HARTLEY-KRAUSE METHOD, AFTER PRELIMINARY LIGATION OF THE EXTERNAL CAROTID ARTERY.[1]

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It is due to the courtesy of Dr. Thomas G. Morton that it has been my privilege to operate on this case and to report it. By several years, it is yet too early to announce it as a cured case of trifacial neuralgia. It is, therefore, only published now to add to the scant existing testimony concerning the utility or fatuity of ligating the external carotid artery as a step preliminary to the Hartley-Krause method of excising the Gasserian ganglion.

Case of H. S., fifty-five years of age, a blacksmith, who was admitted to the Orthopædic Hospital, of Philadelphia, on July 11, 1899.

The family history is negative. The past history: He does not use tobacco, takes alcohol moderately, and denies specific disease. During the past few months he has occasionally taken small amounts of laudanum to relieve the extreme pain of a right trifacial neuralgia. Excepting neuralgia, he has always enjoyed good health.

The present complaint is that of a right-sided facial neuralgia which began nine years ago. It followed sudden chilling immediately after hard work at blacksmithing. The pain at this time resembled toothache, and several teeth on the right, the affected side, were removed, but without relief.

Four years ago, April 22, 1895, the attacks of pain had become so severe, frequent, and of such duration that Dr. T. G. Morton excised the right infra-orbital nerve. Eight months' relief from pain followed this operation.

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[1] Read before the Philadelphia Academy of Surgery, November 6, 1899.

February, 1896.—Nine months after the infra-orbital operation the right inferior dental nerve was excised by Dr. T. G. Morton. Eighteen months' relief from pain resulted.

July 11, 1899.—During the past two years the attacks of pain have increased in frequency, severity and duration. The acts of swallowing, of eating, and of washing the face provoke paroxysms of pain which are agonizing. Temporary relief is sometimes obtained by hard pressure against the cheek. He has been unable to work for some months. He suffers most at night, and cannot sleep till morning.

The physical examination found the heart, lungs, urine, muscular power and action and the sense of taste normal.

The nasal passages exhibited structural deformities and evidences of chronic disease, but not of sufficient degree to cause pressure and excite pain. The presence of pharyngitis and thickened vocal cords were also observed. The hearing is impaired.

The examination of the eyes, kindly made by Dr. A. G. Thomson, discovered in the left fundus a patch of choroiditis that suggested a specific history. The eyes were otherwise normal. The first, the infra-orbital, operation was followed by closure of the right lachrymal duct, and constant watering of the right eye.

The reflexes were normal, with the exception of the knee-jerks, which were impaired.

Sensation was hyperæsthetic in four areas of the right face: First, under the right eye; second, at the angle of the mouth; third, in the vicinity of the infra-orbital scar; and fourth, about the external auditory meatus.

The electrical reactions of the muscles of the face and head, for which I am indebted to Dr. Boyer, were of equal character. The weakest current was used to elicit the response, and even it caused much pain.

The patient was informed that the mortality of Gasserian ganglion removed was about 20 per cent., and he was advised not to run the grave risks of operation unless he considered that life, in his present condition, had become intolerable and not too dear to risk for the sake of at least temporary relief. He elected the operation; a date was set for it and the details of procedure considered.

The reports of operators and the memory of a Gasserian ganglion operation that I had witnessed gave me a wholesome respect for middle meningeal hæmorrhage, and a readiness to try the effect of a preliminary ligation of the external carotid, as successfully practised by Fowler in his second Gasserian ganglion operation, for which he prepared, and was the first one to prepare, by an external carotid ligation. In his third operation he did his second preliminary ligation of the external carotid,—but this time, on raising the dura from the base of the skull he was so embarrassed by hæmorrhage that he had to pack with gauze and attempt the completion of the operation later, when he was again met by hæmorrhage, which prevented removal of the ganglion. The vessels from which the hæmorrhage came were not named.

The favorable results of L. McL. Tiffany, of Baltimore, obtained by excising the trunks of the second and third branches of the fifth nerve, and of the external two-thirds of the ganglion, that is,—the part of it that is in continuity with the trunks of the second and third branches,—led me to prefer this conservative procedure. It, from reported results, seemed to be sufficiently radical while being free from a history of subsequent loss of the eye on the affected side, such as has followed complete ganglion removal, with the division of the first or ophthalmic branch of the nerve in patients of Rose, Krause, Keen and also of Tiffany.

The day before the operation the carotid ligation and ganglion excision were rehearsed, respectively, on both sides of the head and neck of a cadaver. This proved a most valuable preparation and brought home the necessity, in cutting the bone flaps, to carry the bone cutting fully down to the level of the upper border of the zygoma, to insure a flap that hinges on a level with the floor of the skull. Failure to secure this much embarrasses the operation. The difficulty experienced and the care required for the separation of the dura from the floor of the skull, and from the ganglion itself, was a very necessary training.

July 19, 1899.—The operation was performed with the invaluable assistance of Dr. T. S. K. Morton. The external carotid was ligated near the angle of the jaw and above the hypoglossal nerve.[1] The aim was to tie above the facial and occipital arteries.

A Hartley-Krause flap was cut, chiselled and turned down on a level with the floor of the skull, and though the middle meningeal artery tunneled the bone of the flap and was cut transversely, there was no hæmorrhage. The dura was separated from the base of the skull and then slightly slit, as recommended by Tiffany, to get rid of the cerebro-spinal fluid. An excellent view of the field of operation was thus obtained, there being no need of artificial light.

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[1] Subsequent reference to dissections leaves me without doubt that I did tie above the arteries.

The second branch of the nerve, at the foramen rotundum, was secured by a ligature passed beneath it by a small aneurism needle. The third branch was seized at the foramen ovale by forceps. The two trunks were severed by a cutting hook and the distal ends tucked into the foramina. With the ligature and the forceps as a hold the external two-thirds of the ganglion was now dissected, cut, torn, and curetted away. It was most adherent and was removed in fragments too small to promise results from microscopic study.

A little venous oozing drained continually into the field of operation, which was, as it were, the bottom of a well, but kept in easy view by sponging, and there was at no time a flow of blood that could be called active hæmorrhage.

A gauze drain was left at the base of the brain and brought out at the posterior angle of the wound. The pericranium was sutured independently from the scalp so as to prevent depression of the bone flaps. Where the path of the bone cutting has been broad, depression of the bone flap may be prevented by inserting in each of its angles and in its summit a sterilized peg, to be received in a slot in the skull border opposite.

The eye was closed with adhesive plaster. The double operation occupied nearly two hours. The anæsthetic was ether.

The night of the day of operation the patient suffered from violent ether delirium. He was perfectly rational on the following morning, when the hyperæsthetic areas were found to have become anæsthetic. On account of the flow of cerebro-spinal fluid the dressings were twice reinforced in the first twenty-four hours, at the end of which some of the gauze packing was removed, and it was all out on the second day. The bowels were opened on the second day. On the third day a stitch that had slipped was re-introduced, after slight curetting of the neighboring edges of the wound. The temperature on this day reached its highest point, which was 100°. The convalescence was uneventful. The extremes of pulse rate were 110 and and 65, and of respiration, 24 and 17. The stitches were out on the seventh and the patient in his chair on the eleventh day. He went to a shop to be fitted for goggles on the tenth, and was discharged on the thirty-first day.

For the care of the eye I am much indebted to the kind suggestion of Dr. William J. Taylor. It was washed several times a day with boric acid solution and kept closed till fitted with goggles, which were worn as a protection for several weeks and gradually abandoned. Examination of the eye by Dr. Thomson at the time of the patient's discharge discovered no change resulting from the operation.

On examining the electrical reactions Dr. Boyer reported no change resulting from the operation, except that whereas before the muscles had responded to three and one-half milliampères, which had caused pain, it took eight and one-half milliampères after the operation to elicit muscular contraction, and it was unattended by pain.

Exhibition of Patient.—It is now two and a half months since the operation, and, excepting one momentary twinge, there has been no return of pain, but there is unequal action of the lower jaw and a dribbling of saliva, which in this instance are the price paid for release from neuralgic pain and for section of the motor fibres of the third branch of the fifth nerve. It was intended, as advised by Tiffany, to attempt the isolation and conservation of these fibres and so avoid this loss of jaw and cheek control, but the time occupied by the essential steps in this operation did not permit it. If the circumstances are favorable I think the effort should be made to save these fibres, and if I were again operating for Gasserian ganglion removal, my present experience would lead me to again, as a preliminary step, tie the external carotid.